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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,140	01/14/2002	Norio Taniguchi	36856.598	6862

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EXAMINER

SUMMONS, BARBARA

ART UNIT	PAPER NUMBER
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2817

DATE MAILED: 04/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/043,140

Applicant(s)

TANIGUCHI, NORIO

Examiner

Barbara Summons

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 2/27/04 (amendment) and 3/17/04 (RCE).
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed (on 3/17/04) in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission previously filed on 2/27/04 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-19 are rejected under 35 U.S.C. § 102(b) as being anticipated by Ushiroku et al. U.S. 6,137,380 (of record) for reasons of record substantially repeated below and modified to address the claims as amended.

Figs. 4, 5, and 38 of Ushiroku et al. disclose a surface acoustic wave (SAW) ladder filter circuit 21 comprising: a piezoelectric substrate 22; a plurality of parallel arm resonators (23, 25, 27) and a plurality of series arm resonators (24, 26); a plurality of inductors respectively connected in series to the plurality of parallel arm resonators which are best seen in Fig. 39, wherein the inductors L1 are the bond wires in Fig. 38, the inductors L2 are package inductances, and the inductors L3 are the inductance of

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the electrodes to be grounded (see col. 19, lines 25-28); wherein the parallel arm resonators include a first parallel arm resonator (i.e. 23 or 27) connected to one of the input and the output of the filter, and a second parallel arm resonator 25 connected to a junction between two series arm resonators; the parallel arm resonators inherently have a capacitance proportionally related a product of the number of electrode finger pairs and the overlap length of the electrode fingers (see other prior art of record as evidence of the inherency), wherein the first parallel arm resonator (e.g. 23) has a capacitance C_{p1} proportional to $50 \times 60 = 3000$ (see col. 7, Table 1) and the second parallel arm resonator 25 has a capacitance C_{p2} proportional to $120 \times 120 = 14400$ so that $C_{p1} \times 2 < C_{p2}$; and wherein the total equivalent inductance L_c (col. 20, lines 13-15), which is connected to the second parallel arm resonator 25, is substantially equal to a total equivalent inductance L_c of all of the inductors L_1 , L_2 and L_3 connected to the first parallel arm resonator (e.g. 23 or 27) [col. 20, lines 13-15].

Regarding claims 3, 4, 8, 9, 11 and 12, the SAW ladder filter is in a package which has a plurality of electrode pads 143a-c and 144a-c (Fig. 38), which are connected to the series and parallel arm resonators by bonding wires; and wherein the second parallel arm resonator 25 is connected to two electrode pads 143c and 144a connected to ground potential; and wherein the length of one bonding wire 155c connected to the second parallel arm resonator 25 and electrode pad 143c is substantially equal to or less than (actually necessarily shorter/less than) the length of any of the other of the bonding wires 155a,b,e, or f connected to the first parallel arm resonator 23 or 27, and so bonding wire 155c inherently has an inductance that is less

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than the inductance of the inductors of bonding wires 155a,b,e or f connected to the first parallel arm resonator 23 or 27.

Regarding claims 2 and 7, the resonance frequency of the second parallel resonator 25 [i.e. related to the interdigital transducer (IDT) wavelength see col. 7, Table 1] is lower than the resonance frequency of the first parallel resonator 23 because the IDT wavelength of the second parallel arm resonator is longer. Regarding claims 5, 10, and 13-17, the SAW ladder filter is itself a communication apparatus, and it is a bandpass filter (see e.g. col. 1, Ins. 13-14). Regarding claim 6, C_{p1} proportional to 3000 and C_{p2} proportional to 14400, equates to C_{p2} being approximately $4.8 \times C_{p1}$, and therefore less than $C_{p1} \times 10$. Regarding claims 18 and 19, there are two first parallel resonators 23 and 27 connected to the input and output of the filter device with the second parallel arm resonator 25 disposed between them.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ushiroku et al. U.S. 6,137,380 (of record) in view of Satoh et al. U.S. 5,631,612.

Ushiroku et al. discloses the invention as discussed above, except for disclosing a "total equivalent inductance" of all of the inductors connected to the second parallel

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arm resonator 25 being "less than" a total equivalent inductance of all of the inductors connected to the first parallel arm resonator 23. That is, Ushiroku et al. teaches only the "equal to" part of the claim language (see col. 20, lines 13-15).

Satoh et al. teaches that it is known to provide a parallel resonator R3 (Fig. 25) connected between two series resonators with a total equivalent inductance of 5.5nH that is less than a total equivalent inductance 7nH of a parallel resonator R5 connected to the input or output of the ladder filter in order to improve band pass filter side lobe characteristics without reducing the pass band width (see col. 12, lines 44-52).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW ladder of Ushiroku et al. such that the total equivalent inductance of all of the inductors connected to the middle parallel resonator would have been less than the total equivalent inductance of all of the inductors connected to the input or output resonator, because such an obvious modification would have been a well known method of providing the benefit of improved filter side lobe characteristics without a reduction in pass band width, as suggested by Satoh et al. (Fig. 25 and col. 12, lines 44-52), and would have been dependent upon the desired filter design characteristics based upon the desired use of the filter as would have been known by one of ordinary skill.

Allowable Subject Matter

6. Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

7. Applicant's arguments filed 2/27/04 have been fully considered but they are deemed not persuasive.

Firstly, Applicant argues that the "unique combination and arrangement of elements recited..." provides benefits over the prior art (e.g. "sufficient attenuation in each stop band" and "superior steepness") [see the paragraph bridging pages 9 and 10 of 11, of the amendment received 2/27/04]. This argument is not persuasive because it is not commensurate with the scope of the claims.

Applicant next argues that the Examiner acknowledged "in the paragraph bridging pages 3 and 4 of the outstanding Office Action, Ushiroku et al. fails to teach or suggest that a total equivalent inductance of all...bonding wires (inductors) connected to a first parallel arm resonator is equal to or less than a total equivalent inductance of all of the bonding wires (inductors) connected to a second parallel arm resonator" (see page 10, lines 18-22 of the amendment). This argument is not persuasive because it is an improper characterization of the Examiner's position, as the Examiner clearly pointed out that Ushiroku et al. would be considered to meet the "substantially equal to" portion of the claim even if the claim were to include total equivalent inductance (see the prior Office action page 4, lines 1-5, 11-14 and 18-20 and see the Advisory Action at the section 2. Note). Additionally, note that the argument has been stated in the reverse since the "first parallel arm resonator" and "second parallel arm resonator" have been reversed from the claim language in the argument.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

bs
April 6, 2004



BARBARA SUMMONS
PRIMARY EXAMINER